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Operations and Maintenance Plan for Test Area North, Operable Unit 1-10

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Operations and Maintenance Plan for Test Area North, Operable Unit 1-10

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November 2001

Approved by

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Date

ABSTRACT

This operations and maintenance plan describes the long-term operations and maintenance activities that will be conducted at Waste Area Group 1, Operable Unit 1-10, to ensure the selected remedies identified in the Record of Decision remain protective of human health and the environment. The sites in Operable Unit 1-10 that will require operations and maintenance activities are the Soil Contamination Area South of the Turntable (TSF-06, Area B), Disposal Pond (TSF-07), V-Tanks (TSF-09 and TSF-18), PM-2A Tanks (TSF-26), and the Burn Pits (TSF-03 and WRRTF-01). The Fuel Leak site (WRRTF-13) will not require operations and maintenance activities.

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ACRONYMS

bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EPA	U.S. Environmental Protection Agency
ER	environmental restoration
IDEQ	Idaho Department of Environmental Quality
INEEL	Idaho National Engineering and Environmental Laboratory
M&O	management and operations (contractor)
O&M	operations and maintenance
OU	operable unit
PM	project manager
ROD	Record of Decision
TAN	Test Area North
TSF	Technical Support Facility
UST	underground storage tank
WAG	waste area group
WRRTF	Water Reactor Research Test Facility

Operations and Maintenance Plan for Test Area North, Operable Unit 1-10

1. INTRODUCTION

This site-specific operations and maintenance (O&M) plan describes the long-term activities and procedures required to satisfy requirements of the Operable Unit (OU) 1-10 Final Record of Decision (ROD) at each of the following areas:

- Soil Contamination Area South of the Turntable (Technical Support Facility [TSF]-06, Area B)
- Disposal Pond (TSF-07)
- V-Tanks (TSF-09 and TSF-18)
- PM-2A Tanks (TSF-26)
- Burn Pits (TSF-03 and Water Reactor Research Test Facility [WRRTF]-01).

At the completion of the remedial action activities at OU 1-10, operations and maintenance at the remedial action sites identified above will be necessary to ensure protection of human health and the environment. Operations and maintenance will not be necessary at the Fuel Leak site (WRRTF-13) because the site concentrations of potential contaminants determined from post-ROD sampling are less than concentrations allowing unrestricted land use. This O&M plan will not further discuss the Fuel Leak site (WRRTF-13). Basic elements of this O&M plan are as follows:

- Section 2—Background on the nature of the contamination at each site and a description of the current controls
- Section 3—A description of the requirements for institutional controls, environmental monitoring, site-specific operations and maintenance, and five-year reviews
- Section 4—A description of operations and maintenance implementation including organization and responsibilities and requirements for conducting monitoring, maintenance, inspections, and repairs
- Section 5—A summary of reporting requirements for institutional controls, environmental monitoring, site-specific operations and maintenance, and five-year reviews.

Maintenance and repair requirements for institutional controls are addressed in the *Institutional Control Plan for the Test Area North Waste Area Group 1* (INEEL/EXT-2000-00917).

Photographs will be used to enhance the informative quality of the comprehensive documentation whenever possible, particularly when scheduled maintenance activities result in comments by the inspector. A record of these photographs, preserved in a site inspection photo log, will be maintained in the WAG 1 Project file and made available for review by the Department of Energy Idaho Operations Office (DOE-ID), U.S. Environmental Protection Agency (EPA) Region 10, and the Idaho Department of Environmental Quality (IDEQ) (herein after referred to as the Agencies).

2. BACKGROUND

Between the 1950s and 1980s, research activities at the Idaho National Engineering and Environmental Laboratory (INEEL) left behind contaminants that pose risks to human health and the environment. A comprehensive remedial investigation/feasibility study was initiated in 1995 to determine the nature and extent of the contamination at Test Area North (TAN). The investigation is detailed in the *Comprehensive Remedial Investigation/Feasibility Study for the Test Area North Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory* (DOE-ID 1997). A comprehensive investigation supplement was also prepared to provide additional information to help the Agencies and the public evaluate the alternatives (DOE-ID 1998).

Operations and maintenance activities will occur at five low-level radionuclide-contaminated soil/sediment release sites and two nonradionuclide-contaminated soil/sediment release sites. These sites are (1) Soil Contamination Area South of the Turntable (TSF-06, Area B), (2) Disposal Pond (TSF-07), (3) V-Tanks (TSF-09 and TSF-18), (4) PM-2A Tanks (TSF-26), and (5) Burn Pits (TSF-03 and WRRTF-01).

2.1 Soil Contamination Area South of the Turntable (TSF-06, Area B)

The Soil Contamination Area South of the Turntable (TSF-06, Area B) is an open area bounded by the TSF fence on the west and facility roads and several adjacent structures on the east and south. The site is approximately 206 m (675 ft) wide on the south and 130 m (425 ft) wide on the west.

Surface soil at the site was contaminated by windblown radioactive particles from the contaminated soil at the PM-2A Tanks site (TSF-26). Cesium-137 contamination remains in a 152.4- by 30.5-m (500- by 100-ft) area extending beneath an adjacent roadway (Snake Avenue) after the OU 10-06 removal action. No intrusive activities can be performed in this area without contacting the INEEL Environmental Restoration (ER) Program.

2.2 Disposal Pond (TSF-07)

The Disposal Pond (TSF-07) is a 14-ha (35-acre), unlined disposal pond southwest of the TSF with a 1-ha (2.5-acre) portion of the pond still in use. This portion will undergo assessment when operations cease. In the northeast corner and on the eastern edge of the pond, 2 ha (5 acres) have been contaminated. Historically, the pond received sanitary waste discharges, low-level radioactive waste, industrial wastewater, and treated sewage effluent. The active portion of the pond is permitted by the State of Idaho to receive only sanitary and industrial waste.

Cesium-137 is the only contaminant of concern identified at the Disposal Pond and it will decay to acceptable residential scenario levels within the institutional control period. Sampling indicates that cesium has migrated to approximately 3 m (11 ft) below the bottom of the pond.

Currently the Disposal Pond is administratively controlled. The entire 14-ha (35-acre) pond is fenced and separated into two areas by a fence along a center berm. TSF-07 is located in the east portion of the pond and is posted with signs that identify it as a radiologically contaminated soil area. No activities can be performed at the pond without contacting the INEEL ER Program. Entry into the site requires a radiological work permit.

2.3 V-Tanks (TSF-09 and TSF-18)

The two V-Tanks sites (TSF-09 and TSF-18) have similar attributes and are situated in an open area east of building TAN-616 and north of TAN-607.

Site TSF-09 includes the contents of three abandoned underground storage tanks (USTs), each with a capacity of 37,850 L (10,000 gal), and the surrounding contaminated soil. Two of the tanks (V-1 and V-2) contain approximately 4,542 L (1,200 gal) of liquid and 1,703 and 2,081 L (450 and 550 gal) of sludge, respectively. The third tank (V-3) contains approximately 22,712 L (6,000 gal) of liquid and 2,574 L (680 gal) of sludge.

Site TSF-18 includes the contents of an abandoned 1,514-L (400-gal) UST (V-9) and the surrounding soil. The tank contains approximately 416 L (110 gal) of liquid and 94 L (25 gal) of sludge.

The V-Tanks were installed in the early 1950s as part of a system designed to collect and treat radioactive liquid effluents from TAN operations. The TSF-09 tanks are buried approximately 3 m (10 ft) below ground surface (bgs), and the TSF-18 tank is buried approximately 2 m (7 ft) bgs. The soil at the site was contaminated with Cs-137 as a result of spills when waste was transferred to and from the tanks. Sampling of the soil indicated the contaminated soil could pose a risk to current and future workers. The tank contents are contaminated with radionuclides, heavy metals, organic compounds, and polychlorinated biphenyls.

Currently, TSF-09 and TSF-18 are administratively controlled. The site is fenced and posted with signs identifying the area as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site. No activities can be performed in the tank area without contacting the INEEL ER Program. Entry into either site requires a radiological work permit.

2.4 PM-2A Tanks (TSF-26)

The PM-2A Tanks (TSF-26) consist of two abandoned 189,270-L (50,000-gal) USTs (V-13 and V-14) and the contaminated surface soil around them. The volume of waste in each tank is less than 379 L (100 gal) of liquid and 8,517 L (2,250 gal) of sludge. The tanks are approximately 5 m (15 ft) bgs and rest in concrete cradles.

The tanks were installed in the mid-1950s and stored concentrated low-level radioactive waste from the TAN evaporator from 1955 to 1981. The tanks currently contain sludge contaminated with radionuclides, heavy metals, organic compounds, and polychlorinated biphenyls. In 1981 the tanks were partially filled with material to absorb free liquid. The soil above the tanks was contaminated by spills containing Cs-137 when waste was transferred from the tanks. Contaminated soil was removed in 1996 as part of the OU 10-06 removal action; however, sampling that followed the removal action indicated the remaining soil contamination could pose an unacceptable risk to human health.

Currently, the PM-2A Tanks are administratively controlled. The site is fenced and posted with signs identifying the area as a CERCLA site. No activities can be performed in the tank area without contacting the INEEL ER Program. Entry into either site requires a radiological work permit.

2.5 Burn Pits (TSF-03 and WRRTF-01)

The Burn Pits (TSF-03 and WRRTF-01) were used for open burning of construction debris. The TSF-03 Burn Pit was used from 1953 to 1958; the WRRTF-01 Burn Pits were used from 1958 to 1975.

The TSF-03 Burn Pit is located in the northeast corner of TSF, outside the facility fence. The site is covered with 0.6 to 1.8 m (2 to 6 ft) of clean soil, which eliminates the potential for worker exposure.

The four WRRTF-01 Burn Pits are located north of WRRTF, outside the facility fence. The pits are covered with approximately 15 cm to 2.7 m (6 in. to 9 ft) of clean soil and revegetated.

The only contaminant of concern identified at the Burn Pits is lead. While lead does not present a risk that can be calculated using risk guidelines, the EPA has established a residential screening level of 400 mg/kg to address the human health risk caused by lead. Contamination within the top 3 m (10 ft) of soil could be a risk to a hypothetical future resident if the subsurface soil was disturbed and brought to the surface.

Currently, TSF-03 and WRRTF-01 are administratively controlled with signs identifying the areas as CERCLA sites. No activities can be performed at the pits without contacting the INEEL ER Program.

3. DESCRIPTION OF OPERATIONS AND MAINTENANCE

3.1 Institutional Controls

Institutional controls have been implemented and are being maintained by the U.S. Department of Energy (DOE) at any CERCLA site at the INEEL where residual contamination precludes unrestricted land use. The DOE ensures that administrative and physical institutional controls will be in effect over the next 100 years, unless a five-year review concludes that unrestricted land use is allowable and institutional controls will no longer be required. After 100 years, DOE may no longer manage the land within the current INEEL boundary; therefore, controls will take the form of land-use restrictions. Institutional controls will not be required if contamination concentrations are comparable to local background values, or if residual concentrations are less than or equal to a 1E-04 risk-based soil concentration for a hypothetical current or future residential scenario, or current or future industrial scenario (DOE-ID 1999). All administrative and physical institutional control requirements, including implementation, maintenance, inspection, and reporting, are addressed in the *Institutional Control Plan for the Test Area North Waste Area Group 1* (INEEL/EXT-2000-00917).

3.2 Environmental Monitoring

The purpose of environmental monitoring is to ensure that the selected remedy remains protective and achieves the remedial action objectives as outlined in the ROD. Environmental monitoring in this section refers to activities that involve field sampling or monitoring of the concentrations of the contaminants of concern. Environmental monitoring will be required at the Soil Contamination Area South of the Turntable (TSF-06, Area B), Disposal Pond (TSF-07), the V-Tanks (TSF-09 and TSF-18), and the PM-2A Tanks (TSF-26). Based on the results of post-ROD sampling at the Burn Pits (TSF-03 and WRRTF-01), no environmental monitoring is required at these sites.

Radiological surveys will be conducted annually around the perimeter of the Soil Contamination Area South of the Turntable, Disposal Pond, V-Tanks, and the PM-2A Tanks sites. Selected sampling will be performed at the Disposal Pond in 2071 (date when average concentrations for Cs-137 are expected to decay to the unrestricted land use level of 2.3 pCi/g) to determine if the site can be released for unrestricted land use. Environmental monitoring may be discontinued at any of these sites as a result of a five-year review if the Agencies decide that monitoring is no longer required. The Agencies may also change the frequency of environmental monitoring as a result of a five-year review.

3.3 Site-Specific Operation and Maintenance

3.3.1 Soil Contamination Area South of the Turntable (TSF-06, Area B)

The selected remedy for the Soil Contamination Area South of the Turntable is Excavation and Disposal. The excavation of contaminated soil addresses the principal risks posed by the site. This will remove the source of contamination and interrupt the path by which a future receptor may be exposed. Institutional controls will be maintained during the remedial action based upon the requirements of the ROD; the specific control measures that will be implemented and maintained are in the WAG 1 Institutional Control Plan. Intrusion monitoring and subsidence/erosion inspections will be conducted annually; however, the frequency of these inspections may be modified by the Agencies after the first five-year review.

3.3.2 Disposal Pond (TSF-07)

The selected remedy for the Disposal Pond is Limited Action. The Limited Action remedy will consist of institutional controls and environmental monitoring. The remedy addresses the principal risks posed by the site by allowing Cs-137 to decay to acceptable risk levels within the period of institutional control.

Institutional controls will prevent access to the area and exposure to contaminated media until such time that the risk from Cs-137, due to decay, will diminish to acceptable risk levels for unrestricted land use. Details of the institutional controls that will be implemented and maintained at the Disposal Pond are presented in the WAG 1 Institutional Control Plan.

3.3.3 V-Tanks (TSF-09 and TSF-18)

The selected remedy for the V-Tanks is Soil and Tank Removal, Ex Situ Treatment of Tank Contents, and Disposal. The excavation of contaminated soil and the treatment and disposal of tank contents address the principal risks posed by the V-Tanks. This will remove the source of contamination and interrupt the path by which a future receptor may be exposed.

Institutional controls will be maintained during the remedial action based upon the requirements of the ROD, and the specific control measures that will be implemented and maintained are in the *Institutional Control Plan for the Test Area North Waste Area Group 1* (INEEL/EXT-2000-00917.). Intrusion monitoring and subsidence/erosion inspections will be conducted annually; however, the frequency of these inspections may be modified by the Agencies after the first five-year review.

3.3.4 PM-2A Tanks (TSF-26)

The selected remedy for the PM-2A Tanks is Soil Excavation, Tank Content Vacuum Removal, Treatment, and Disposal. The excavation of contaminated soil and the disposal of tank contents address the principal risks posed by the PM-2A Tanks. This will remove the source of contamination and interrupt the path by which a future receptor may be exposed.

Institutional controls will be maintained during the remedial action based upon the requirements of the ROD; the specific control measures that will be implemented and maintained are in the WAG 1 Institutional Control Plan. Intrusion monitoring and subsidence/erosion inspections will be conducted annually; however, the frequency of these inspections may be modified by the Agencies after the first five-year review.

3.3.5 Burn Pits (TSF-03 and WRRTF-01)

The selected remedy for the Burn Pits is a Native Soil Cover, which will address the low-level threat posed by the lead contamination at this site. The native soil cover reduces potential exposure to contaminated media.

Institutional controls will be used at the Burn Pits to reduce current and future occupational and residential exposure at the site to acceptable levels. Details of the institutional controls that will be implemented and maintained at the Burn Pits are presented in the WAG 1 Institutional Control Plan. Intrusion monitoring and subsidence/erosion inspections will be conducted annually; however, the frequency of these inspections may be modified by the Agencies after the first five-year review.

3.4 Five-Year Reviews

Five-year reviews will be conducted to evaluate the effectiveness of the remedies at those sites with risks remaining greater than the 1E-04 level. Five-year reviews will not be required at sites that are available for unrestricted land use after the completion of remedial action. The five-year reviews will determine whether the selected remedy for each site remains protective and will assess the need for additional institutional controls or environmental monitoring. The five-year reviews will be conducted until risk is less than or equal to 1E-04, as documented in a five-year review.

The first five-year review will be conducted within five years of the start of remedial action construction at OU 1-10, and subsequent five-year reviews will be completed within five years of the previous five-year review. Based on the working schedule in the OU 1-10 Group 1 Remedial Design/Remedial Action Work Plan (DOE-ID 2000), the first remedial action (TSF-06) was started in 2000; therefore, the first five-year review is anticipated to be conducted in 2005.

Specific criteria for conducting five-year reviews for OU 1-10 will be developed and included in the next revision to this operations and maintenance plan, which is planned in conjunction with the Group 3 Remedial Design/Remedial Action Work Plan.

4. OPERATIONS AND MAINTENANCE IMPLEMENTATION

This section summarizes the activities to implement the operations and maintenance (O&M) requirements, including monitoring, inspection, maintenance, and repairs; outlines the organizational practices that will drive the O&M activities; and specifies the individuals responsible for performing the activities required for OU 1-10. As described in Section 3, there are no planned operations activities or scheduled maintenance activities. However, based on inspections performed in support of maintaining institutional controls and maintaining remedial action sites, it may be necessary to perform unscheduled maintenance and repairs.

4.1 Organization and Responsibilities

4.1.1 DOE Project Manager

The DOE-ID WAG 1 remediation project manager (PM) is responsible for the following:

- Ensuring the O&M activities are performed in accordance with this approved plan
- Coordinating the activities of the INEEL Management and Operations (M&O) Contractor at WAG 1, OU 1-10.

4.1.2 INEEL M&O Contractor

As the point of contact for O&M activities, the INEEL M&O Contractor WAG 1 remediation PM will be responsible for the following:

- Maintaining document control of inspection reports, including their placement in the project records file
- Performing required repairs, including administration of subcontracts
- Reporting activities to DOE-ID.

4.2 Conducting Monitoring, Maintenance, Inspections, and Repairs

The WAG 1 M&O Contractor will provide qualified personnel to perform the O&M activities for the remedial actions under the OU 1-10 ROD. Personnel will be trained on the requirements of the approved plan prior to performing O&M activities. The INEEL M&O Contractor WAG 1 PM is responsible for the implementation and reporting of inspections. After five years, the frequency of O&M activities, including inspection and reporting, may be reevaluated by the Agencies.

4.2.1 Institutional Controls

Requirements and frequency for institutional control inspection and maintenance are addressed in the Institutional Control Plan for the Test Area North Waste Area Group 1, (INEEL/EXT-2000-00917). The inspections will address institutional control requirements for each site such as identification and warning signs, visible access restrictions, administrative controls, and land use restrictions.

4.2.2 Environmental Monitoring

Environmental monitoring at the sites specified in Section 3.2 will be performed as indicated in Table 4-1.

4.2.3 Operations and Maintenance

Inspection of WAG 1, OU 1-10 sites (those specified in Section 3.3) will be performed as specified in Table 4-2. Inspections of the sites will be of three types:

- Annual scheduled inspections
- Follow-up inspections
- Contingency inspections.

No routine maintenance is planned for the sites. Maintenance and repair of soil cover will be performed as necessary based on the inspection results. Follow-up inspections will be performed to verify adequacy of maintenance and repairs.

Contingency inspections are unscheduled inspections ordered by DOE-ID. Events that may trigger contingency inspections include severe rainstorms, floods, or highly unusual events such as tornadoes or earthquakes.

Table 4-1. Summary of the OU 1-10 environmental monitoring requirements.

Site	Monitoring Requirement	Monitoring Frequency[a]	Review Period
Soil Contamination Area South of the Turntable (TSF-06, Area B)	Radiological survey of site perimeter	Annual	5-year reviews for 100 years
Disposal Pond (TSF-07)	Radiological survey of site perimeter	Annual	5-year reviews for 100 years
Disposal Pond (TSF-07)	Sampling for releasing land use restriction	Year 2071	5-year reviews for 100 years
V-Tanks (TSF-09 and TSF-18)	Radiological survey of site perimeter	Annual	5-year reviews for 100 years
PM-2A Tanks (TSF-26)	Radiological survey of site perimeter	Annual	5-year reviews for 100 years
Burn Pits (TSF-03 and WRRTF-01)	None	N/A	N/A

a. May be revised by the Agencies after the first five-year review.

Table 4-2. Summary of the OU 1-10 O&M inspection requirements.

Site	Inspections	Inspection Schedule[a]	Review Period
Burn Pits (TSF-03 and WRRTF-01)	Native Soil Cover Intrusion Subsidence Erosion	Once annually for the first 5 years	5-year reviews for 100 years
Soil Contamination Area South of the Turntable (TSF-06, Area B)	Intrusion Subsidence Erosion	Once annually for the first 5 years	5-year reviews for 100 years
PM-2A Tanks (TSF-26)	Intrusion Subsidence Erosion	Once annually for the first 5 years	5-year reviews for 100 years
V-Tanks (TSF-09 and TSF-18)	Intrusion Subsidence Erosion	Once annually for the first 5 years	5-year reviews for 100 years
Disposal Pond (TSF-07)	None	N/A	N/A

a. May be revised by the Agencies after the first five-year review.

5. REPORTING REQUIREMENTS

Reporting requirements related to institutional controls, environmental monitoring, operations and maintenance, and five-year reviews are summarized in the following sections. The purpose of reporting is to ensure that all activities are adequately documented and that related data and information are provided to the Agencies for review and decision making. Although the following sections indicate separate reporting requirements and separate reports, the reporting requirements may be met by combining the information into a single annual report. The frequency of the reporting identified in the following sections will be reviewed and may be changed by the Agencies during the first five-year review.

5.1 Institutional Control Reporting

Reporting requirements for institutional controls are specified in the WAG 1 Institutional Control Plan (INEEL/EXT-2000-00917). An annual institutional control monitoring report will be prepared and submitted to the Agencies for information.

5.2 Environmental Monitoring Reporting

Data and results from the annual environmental monitoring will be compiled and addressed in an annual environmental monitoring report. This annual report will be prepared and submitted to the Agencies for information.

5.3 Operations and Maintenance Reporting

Data and results from annual operations and maintenance activities, including inspections, maintenance, and repairs, will be compiled and addressed in an annual report of operations and maintenance. This annual report will be prepared and submitted to the Agencies for information. The report will contain documentation of scheduled, follow-up, and contingency inspections and maintenance activities. It will include

- General OU description and operational history
- A summary of the inspection
- A summary of maintenance activities to date
- An estimate of maintenance activities required in the next year
- An assessment of cover inspection data and applicable photos
- A copy of the appropriate inspection report forms.

5.4 Five-Year Review Reporting

Data and results from the annual reports for institutional controls, environmental monitoring, and operations and maintenance will be summarized and addressed in a five-year review report. Additional content requirements for the five-year review report will be developed and included in the next revision to this operations and maintenance plan, which is planned in conjunction with the Group 3 remedial design/remedial action work plan.

6. REFERENCES

DOE-ID, 1997, *Comprehensive Remedial Investigation/Feasibility Study for the Test Area North Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory,* U.S. Department of Energy, Idaho Operations Office, DOE/ID-10557, Rev. 0, November 1997.

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